REMARKS

Election/Restrictions

Pursuant to item 6 of the office action, the applicants affirm election to prosecute claims 15-24 without traverse. The applicants reserve the right to pursue claims 1-14 and 25-26 in a subsequent related patent application.

Claim Rejections

35 U.S.C. § 112, second paragraph

Claims 15-24 currently stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for use of the term "Class A." Claims 15 and 21 are amended such that the term "Class A" is omitted. Thus claims 15 and 21 are allowable over this rejection, and dependent claims 16-20 and 22-24 are also allowable over this rejection.

Additionally, the office action states that claims 20 and 24 do not describe a particular composition range of the resulting mixture. The applicants amend claims 20 and 24 to clarify the composition range of the resulting mixture.

As described in the application (lines 21-28, page 7 of the application; line 21, page 12 – line 3, page 13 of the application), one embodiment of the invention adjusts the volume ratio of the unpigmented polyol/solvent component and the isocyanate/solvent component such that the two components have a volume ratio between 1.5:1 and 3.0:1, respectively, unlike the conventional procedure of using a volume ratio of 5.5:1 (lines 21-23, page 12 of the application). Also, the composition of the individual solutions, that are combined, are adjusted such that the volume fraction

of solids of the combined mixture is higher than the volume fraction of solids of a combined mixture in the conventional formulation (lines 1-3, page 13 of the application). Claims 20 and 24 are amended to state the volume ratio of polyol/solvent component to isocyanate/solvent component required and the range of total solids fraction of the combined components, in order to practice the invention. Therefore, applicants submit that amended claims 20 and 24 particularly point out and distinctly claim the subject matter of their invention, in accord with 35 U.S.C. § 112, second paragraph, and should thus be allowed.

35 U.S.C. § 102(b)

Claims 15-16 and 19-24 were rejected under 35 U.S.C. §102(b) as being anticipated by Aizawa (4,501,790), as evidenced by Crast (6,365,679). Specifically, the office action states that Aizawa teaches "all the steps the applicant claims in claims 15-16 and 19-24" (item 12, page 6 of the office action). Applicants submit, however, that Aizawa does not teach an in-mold coating method to form an unpigmented, clear-coat surface. Thus Aizawa does not read on claims 15-16 and 19-24.

Applicants' claims 15 and 21 address "[a]n in-mold coating method of preparing a plastic part with a clear-coat surface" that includes mixing two unpigmented reactant/solvent mixtures to form a clear-coat mixture (lines 8-9, page 18 and lines 1-2, page 20). Aizawa teaches "a urethane-based coating material . . . applied and baked to form the top coating film on the surface of the sealer coating film" (lines 56-60, column 7). The films are applied to a molded urethane piece (lines 38-60, column 7). The

reference does not teach an unpigmented, clear-coat surface formed from an *in-mold* coating method. Aizawa appears to teach the formation of a top-coating film after an in-mold process.

More specifically, Aizawa describes an in-mold method for forming a primer coating film and a sealer coating film only (lines 8-14, column 8); the detailed description of the in-mold process refers to a final in-mold product depicted in Fig. 5A (lines 54-57, column 8) that does not show an unpigmented, clear-coat surface layer. Both the primer and sealer coating films contain pigments (Table 3, columns 7-10), and thus do not read on claims 15 or 21. Though Aizawa does teach the initial application of a "releasing agent" before the pigmented layers are applied to the mold (line 31-33, column 8), the layer is not composed of an unpigmented clear-coat mixture that is sprayed "onto the heated mold surface . . . to form a substrate having a clear-coat surface" as required by claims 15 and 21.

Thus, Aizawa does not teach all the elements of claims 15 and 21. Since claims 16, 19-20, and 22-24 are all dependent from claims 15 and 21, they are also not anticipated by Aizawa. Applicants agree with the office action that Crast cites a method "to prepare a sprayable polyurethane-precursor coating" (item 12, page 6 of the office action). Thus, Aizawa, as evidenced by Crast, also does not anticipate claims 15, 21, and those dependent therefrom since neither reveal the formation of a clear-coat surface by an in-mold method. Applicants submit that claims 15-16 and 19-24 are, thus, allowable over the 35 U.S.C. §102(b) rejection.

35 U.S.C. § 103(a)

Claims 17 and 18 under 35 U.S.C. § 103(a) were rejected as being unpatentable over Aizawa, as evidence by Crast, as applied to claim 15, and further in view of Matzinger (5,000,093). As noted above, since neither Aizawa nor Crast teach an in-mold coating process forming an unpigmented, clear-coat surface, claim 15 is allowable. The office action notes that Matzinger does disclose a barrier web layer that acts as a protective coating for a substrate (item 14, page 6 of the office action). However, Matzinger, like Aizawa, does not teach the element of an in-mold coating method forming an unpigmented, clear coat surface. Thus the invention of claim 17 is not obvious to a person having ordinary skill in the art since the prior art does not teach an element of the invention.

Moreover, assuming without conceding that Aizawa teaches an in-mold process that forms an unpigmented, clear coat surface, the combination of Matzinger and Aizawa would not make the invention of claim 17 obvious. Matzinger teaches the use of a protective coating material, in the form of a web or film, drawn over the surface of a mold to form a layer over an in-mold formed plastic substrate (lines 12-16, column 5). Matzinger does not teach the critical element of claim 17, the placement of a barrier formulation applied on a sprayed pigment mixture. Since the film or web interaction with a mold surface is fundamentally different than the film or web interaction on a sprayed pigment mixture, combining Matzinger and Aizawa would not teach the formation of a barrier formulation on a sprayed pigment mixture. Matzinger does disclose the injection of polyol and isocyanate components onto a web or film which has

been placed on a mold to form a molded plastic article covered by the web or film. Even if the web or film is compatible with polyurethane, as stated by the office action, the injection of polyol and isocyanate onto the web or film supported by a mold is fundamentally different from the claimed invention of placing a barrier formulation onto a sprayed pigment mixture.

Thus claim 17 is not obvious to one of ordinary skill in the art in light of Matzinger and Aizawa. Since claim 18 is dependent from claim 17, claim 18 is also not obvious in light of the prior art. Thus applicants submit that claims 17 and 18 are allowable over the 35 U.S.C. § 103(a) rejection.

Conclusion

Applicants believe the application is now in condition for allowance. Consideration of claims 15-24 and issuance of a notice of allowance are respectfully requested.

Attached hereto is a marked up version of the changes made to the claims by the current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

15. An in-mold coating method of preparing a plastic part with a clear-coat surface, the method comprising:

providing a mold having a mold surface having a predetermined degree of finish~~, the degree of finish such that a mating surface of a cured polymer-based material fabricated in the mold would exhibit a "Class A" quality~~;

heating the mold to a temperature between approximately 40 degrees Celsius and approximately 95 degrees Celsius;

providing an unpigmented first-reactant/solvent mixture;

providing an unpigmented second-reactant/solvent mixture;

mixing the unpigmented first-reactant/solvent mixture and the unpigmented second-reactant/solvent mixture to form a clear-coat mixture;

spraying the clear-coat mixture onto the heated mold surface, the clear-coat mixture having an open time on the heated mold surface;

providing a pigmented third-reactant/solvent mixture;

providing a fourth-reactant/solvent mixture;

mixing the pigmented third-reactant/solvent mixture and the fourth-reactant/solvent mixture to form a pigmented mixture;

spraying the pigmented mixture, during the open time of the clear-coat mixture, onto the clear-coat mixture previously sprayed onto the heated mold surface;

applying, over the sprayed pigmented mixture, a substrate-forming material, so as to create an uncured preform; and

allowing the preform to cure so as to form a substrate having a clear-coat surface.

20. The method according to claim 19, ~~wherein~~ further comprising

(a) mixing the unpigmented first-reactant/solvent mixture and the unpigmented second-reactant solvent mixture ~~are mixed~~ at a volume ratio substantially between 1.5:1 and 3.0:1, respectively, to form a combined mixture of unpigmented first-reactant/solvent mixture and unpigmented second-reactant/solvent mixture having a

total volume fraction of solids substantially in the range between 0.30 and 0.60; and ~~wherein~~

(b) mixing the pigmented third-reactant/solvent mixture and the pigmented fourth-reactant solvent mixture ~~are mixed~~ at a volume ratio substantially between 1.5:1 and 3.0:1, respectively, to form a combined mixture of pigmented third-reactant/solvent mixture and pigmented fourth-reactant/solvent mixture having a total volume fraction of solids substantially between 0.30 and 0.60.

21. An in-mold coating method of preparing a plastic part with a clear-coat surface, the method comprising:

providing a mold having a mold surface having a predetermined degree of finish~~, the degree of finish such that a mating surface of a cured polymer-based material fabricated in the mold would exhibit a "Class-A" quality~~;

heating the mold to a temperature between approximately 40 degrees Celsius and approximately 95 degrees Celsius;

providing an unpigmented first-reactant/solvent mixture;

providing an unpigmented second-reactant/solvent mixture;

mixing the unpigmented first-reactant/solvent mixture and the unpigmented second-reactant/solvent mixture to form a clear-coat mixture;

spraying the clear-coat mixture onto the heated mold surface, the clear-coat mixture having an open time on the heated mold surface;

applying, over the sprayed unpigmented mixture, during the open time of the clear-coat mixture, a substrate-forming material, so as to create an uncured preform; and

allowing the preform to cure so as to form a substrate having a clear-coat surface.

24. The method according to claim 23, ~~wherein~~ further comprising mixing the unpigmented first-reactant/solvent mixture and the unpigmented second-reactant solvent mixture ~~are mixed~~ at a volume ratio substantially between 1.5:1 and 3.0:1, respectively, to form a combined mixture of unpigmented first-reactant/solvent

mixture and unpigmented second-reactant/solvent mixture having a total volume fraction of solids substantially in the range between 0.30 and 0.60.

27. The method according to claim 20, wherein the amount of solvent in the unpigmented first-reactant/solvent mixture is reduced relative to the amount of solvent in the unpigmented second-reactant/solvent mixture; and the amount of solvent in the pigmented third-reactant/solvent mixture is reduced relative to the amount of solvent in the pigmented fourth-reactant/solvent mixture.

28. The method according to claim 27, wherein the combined mixture of unpigmented first-reactant/solvent mixture and unpigmented second-reactant/solvent mixture is sprayed onto the heated mold surface in an amount to form a coating layer thickness substantially between 1.5 to 2.0 mils DFT; and the combined mixture of pigmented third-reactant/solvent mixture and pigmented fourth-reactant/solvent mixture is sprayed onto the sprayed combined mixture of unpigmented first-reactant/solvent mixture and unpigmented second-reactant/solvent mixture in an amount to form a coating layer thickness substantially between 1.5 to 2.0 mils DFT.

29. The method according to claim 24, wherein the amount of solvent in the unpigmented first-reactant/solvent mixture is reduced relative to the amount of solvent in the unpigmented second-reactant/solvent mixture.

30. The method according to claim 29, wherein the combined mixture of unpigmented first-reactant/solvent mixture and unpigmented second-reactant/solvent mixture are sprayed onto the heated mold surface in an amount to form a coating layer thickness substantially between 1.5 to 2.0 mils DFT.